

Name _____

Population Growth Curves

Introduction:

When a population grows exponentially, the population could potentially crash as it runs out of resources. This could also lead to the collapse of the entire ecosystem. If, on the other hand, the population exhibits logistic population growth, the growth has an upper limit called the carrying capacity. Once reached, population growth slows and either levels off or oscillates around that point. Competition, predation, disease, and a decrease in resources all contribute to this.

Yeast are single-celled, microscopic fungi that are useful in studying exponential and logistic population growth. Yeast reproduces by budding. In a process called fermentation, yeast extracts oxygen from sugar and produces carbon dioxide and alcohol. As the yeast population increases, more carbon dioxide will be produced and the dough will rise. Thus, dough height is an indirect measure of how much the yeast population has grown.

Data:

Human Population Growth

Year	1730	1830	1930	1960	1965	1970	1975	1980	1985	1990	1995	2000
World Population (in millions)	800	1000	2000	3039	3345	3707	4086	4454	4851	5277	5682	6079

Table 1: Number of Humans on Earth in selected years, 1730- 2000

Yeast Growth

Time (minutes)	0	15	30	45	60	75	90	105	120	135
Height of Dough (cm)	2.0	2.1	2.5	3.0	3.5	3.5	4.0	4.0	4.0	4.0

Table 2: Time for yeast growth as determined by dough height.

Results:

- Make 2 LINE graphs using the data from the tables (one for human population growth and one for yeast growth).
 - Title each graph
 - Label the x and y axis
 - Determine equal intervals for each axis
 - Plot the data points
 - Connect them to form a J or S shaped curve
- Answer the following questions

1. Is the human population growth an example of logistic or exponential population growth? EXPLAIN your answer.

2. Is the yeast growth an example of logistic or exponential population growth? EXPLAIN your answer.

3. Which population (human or yeast) will most likely crash if it continues at that rate? EXPLAIN your answer based on the data/graph.

4. Which population (human or yeast) is more stable? EXPLAIN your answer based on the data/graph.

5. At what dough height did the yeast reach carrying capacity? EXPLAIN how you determined this answer.